



E. I. DU PONT DE NEMOURS & COMPANY  
WILMINGTON, DELAWARE 19898

POLYMER PRODUCTS DEPARTMENT  
EXPERIMENTAL STATION

PERSONAL AND CONFIDENTIAL

cc: A. J. Dahl - 353  
B. W. Karrh - N11400  
L. J. Papa - 269  
Pral File  
I.C.

Complainant's  
Exhibit No. **38**

AR226 1570

May 14, 1981

TO: DR. Y. L. POWER - PPD, Washington Works

FROM: S. S. STAFFORD *S.S. Stafford*

ANALYSIS OF BLOOD SAMPLES FOR PERFLUOROOCTANOATE  
(Job No. 810-190; PRAL Nos. 81-1420-81-1467; Notebook Nos. E22514, E26238)

As requested in your letter of 4/8/81 to L. J. Papa, the 48 blood samples submitted then have been analyzed for perfluorooctanoate ( $C_8$ ). Results and sample identification are given in the attached table.

As noted there, the analysis was done using a gas chromatographic method specific for  $C_8$  (Lab Method Number ES-567) but results have been reported as ppm F for comparison with total organic fluorine analyses. Precision is  $\pm 10\%$  relative standard deviation over most of the concentration range, somewhat less at the lowest values. The lower limit for quantitation is 0.007 ppm F (0.01 ppm perfluorooctanoic acid), with a detection limit of  $\sim 0.004$  ppm which can be distinguished from the reagent background but not well quantitated.

Please contact me (772-4440) or L. J. Papa (772-2745) if you have any questions regarding the analyses. General questions on blood sampling can be directed to J. W. Raines or L. F. Percival.

Attachment  
jah

KeyWords:

Perfluorooctanoic Acid.  
Perfluorooctanoate  
Blood Analysis  
GC

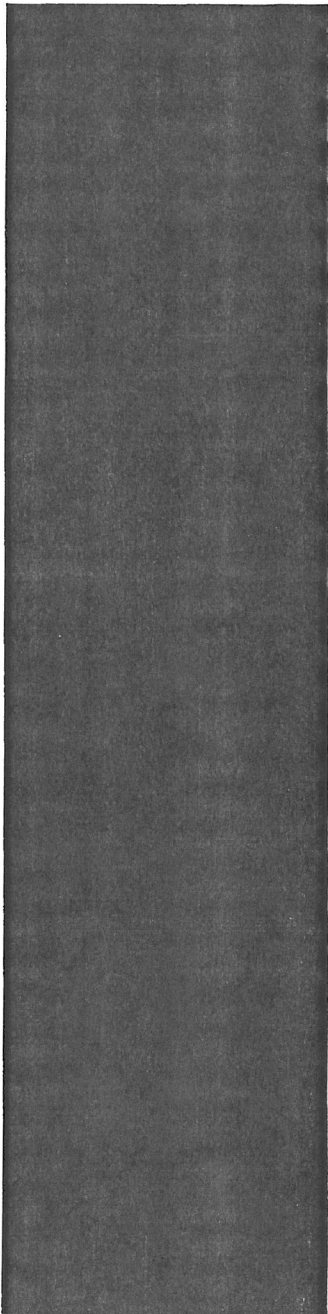
There's a world of things we're doing something about

EXP000003  
EID713817

000064

TABLE I

CONCENTRATION OF PERFLUOROOCTANOATE IN BLOOD (a)

				GC Analysis	
Sample				Date Analyzed	[C <sub>8</sub> ], µg F/g blood <sup>(b)</sup>
PRAL No.	Date Sampled	P.R.No.	Name		
81-1420	4/1/81	4443		4/11/81	0.078
				4/15/81	0.074
81-1421	4/1/81	4101		4/11/81	1.5
81-1422	4/2/81	4226		4/11/81	0.013
81-1423	4/2/81	4449		4/11/81	0.048
81-1424	4/3/81	4530		4/11/81	0.62
81-1425	4/3/81	4621		4/13/81	0.13
81-1426	4/6/81	4490		4/13/81	0.072
81-1427	4/6/81	4283		4/13/81	0.051
81-1428	4/6/81	WS		4/13/81	0.11
81-1429	4/6/81	WS		4/13/81	0.061
81-1430	4/6/81	4109		4/13/81	0.19
81-1431	4/6/81	4316		4/13/81	1.0
81-1432	4/6/81	4282		4/14/81	5.1
81-1433	4/6/81	4243		4/15/81	0.44
81-1434	4/6/81	4520		4/13/81	0.052
81-1435	4/6/81	4177		4/14/81	0.23
81-1436	4/6/81	WS		4/14/81	0.11
81-1437	4/6/81	4293		4/14/81	0.17
81-1438	4/6/81	WS		4/13/81	0.31
81-1439	4/6/81	4225		4/14/81	0.054
81-1440	4/6/81	4182		4/14/81	0.077
81-1441	4/6/81	4250		4/15/81	0.31
81-1442	4/6/81	4547		4/24/81	4.3
81-1443	4/6/81	4181		4/14/81	0.64
81-1444	4/6/81	4551		4/15/81	1.3
81-1445	4/6/81	4514		4/15/81	0.14
81-1446	4/6/81	4624		4/16/81	0.57
81-1447	4/6/81	4444		4/16/81	0.18
81-1448	4/6/81	4251		4/16/81	0.15
81-1449	4/6/81	WS		4/16/81	0.83
81-1450	4/6/81	4111		4/18/81	3.8
81-1451	4/6/81	WS		4/16/81	0.22 (c)

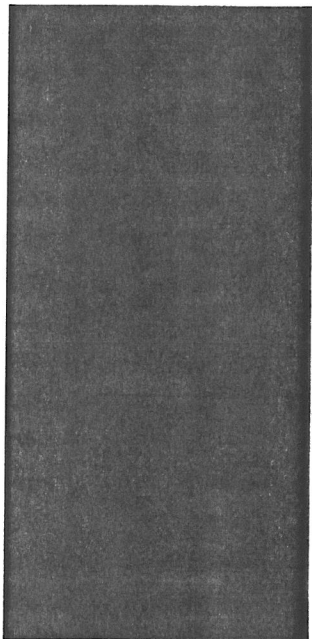
\*REDACTED\*

EXP000004  
EID713818

000065

TABLE I (CONT'D)

CONCENTRATION OF PERFLUOROOCTANOATE IN BLOOD (a)

Sample				GC Analysis	
PRAL NO.	Date Sampled	P.R.No.	Name	Date Analyzed	[C <sub>8</sub> ], µg F/g blood <sup>(b)</sup>
81-1452	4/6/81	4650		4/16/81	0.019
81-1453	4/6/81	4448		4/18/81	0.11
81-1454	4/6/81	4409		4/18/81	0.14
81-1455	4/6/81	4400		4/18/81	2.1
81-1456	4/6/81	4631		4/18/81	0.19
81-1457	4/6/81	4234		4/18/81	4.3
81-1458	4/7/81	4172		4/20/81	4.5
81-1459	4/7/81	4382		4/20/81	0.81
81-1460	4/7/81	4518		4/23/81	1.7
81-1461	4/7/81	4299		4/20 & 4/24/81	4.5
81-1462	4/7/81	4249		4/20/81	1.9
81-1463	4/7/81	4300		4/23/81	2.4
81-1464	4/7/81	4290		4/20/81	0.10
81-1465	4/7/81	WS		4/20/81	0.47
81-1466	4/7/81	4364		4/24/81	3.6
81-1467	4/7/81	WS		4/20/81	0.092

(a) Analysis as described in Lab Method ES-567 ("Determination of Perfluorooctanoic Acid in Blood, Gas Chromatographic Method", S. Stafford, 4/3/81), using the packed column GC analysis with perfluoro-n-octanoic acid as calibration standard.

(b) Although the analysis is specifically for perfluorooctanoate (acid or salts), concentrations are given in ppm fluorine for comparison with the results of total organic fluorine analyses. (ppm F = 0.688 x ppm perfluorooctanoic acid) Estimated uncertainty is  $\pm 10\%$  relative standard deviation. The lower limit for quantitation is 0.007 µgF/g. The detection limit is  $\sim 0.004$  µgF/g, but concentrations in that range cannot be well quantitated and are reported as < 0.007. "None detected" is reported for samples with [C<sub>8</sub>]  $\lesssim 0.004$  ppm, which cannot be distinguished from reagent background.

(c) In GC analysis of this sample one unusual large peak was observed in the region of interest, but no interference with the C<sub>8</sub> peak was apparent.

\*REDACTED\* EXP000005  
EID713819

000066